What is Claimed is:

1   1.   A nano-imprint system comprising:

2   a mold comprising a body having a first surface and an opposite second surface,

3   imprinting patterns being formed in areas of the second surface;

4   an electrostatic plate capacitor comprising first and second metal film electrodes

5   respectively embedded in the first and second surfaces of the mold body and

6   spaced a distance from each other and a metal lead embedded in the mold body

7   and connecting the first and second metal film electrodes;

8   a detection device detecting a capacitance of the electrostatic capacitor and

9   comprising means for converting the capacitance into an amount of deformation

10   of the mold body; and

11   an external monitoring device receiving a signal representing the amount of

12   deformation from the detection device and selectively recording and displaying

13   the amount of deformation and comprising means for comparing the amount of

14   deformation with a reference to determine if the amount of deformation exceeds

15   the reference and selectively issuing a warning and shutting down the system.

1   2.   The system as claimed in Claim 1, wherein the imprinting patterns of the mold body

2   selectively comprise micro-scale patterns and nano-scale patterns.

1   3.   The system as claimed in Claim 1, wherein the metal film electrodes are formed on

2   the mold body without overlapping the imprinting patterns.

1   4.   The system as claimed in Claim 1, wherein the electrostatic plate capacitor and the

2   detection device is coupled to the external monitoring device by a cable.

1   5. The system as claimed in Claim 1, wherein the electrostatic plate capacitor and the

2   detection device is coupled to the external monitoring device in a wireless manner.

1   6. The system as claimed in Claim 5, wherein the wireless coupling comprises a

2   wireless transmitter that receives and encodes the detection result from the detection

3   device and transmits a wireless signal and a wireless receiver that receives the

4   wireless signal and a decoder that decodes the received wireless signal and applies a

5   corresponding signal to the external monitoring device.

1   7. The system as claimed in Claim 1, wherein the detection device comprises a

2   detection circuit for detecting the capacitance of the electrostatic plate capacitor and

3   issues a detection signal, a modulation circuit for modulating the detection signal and

4   issuing a modulated signal, an analog-to-digital converter that receives and converts

5   the modulated signal into a digital signal, and a signal processing circuit that process

6   and converts the digital signal into the amount of deformation of the mold body.

1   8. The system as claimed in Claim 7, wherein the detection circuit, the modulation

2   circuit, the analog-to-digital converter and the signal processing circuit are coupled

3   by physical electrical connections.

1   9. The system as claimed in Claim 7, wherein the detection circuit, the modulation

2   circuit, the analog-to-digital converter and the signal processing circuit are coupled

3   by wireless connections.

1   10.The system as claimed in Claim 9, wherein the wireless coupling comprises a

2   wireless transmitter that receives and encodes a first signal and transmits a wireless

3   signal and a wireless receiver that receives the wireless signal and a decoder that

4   decodes the received wireless signal and issues a corresponding second signal.

1   11.A method for monitoring amount of deformation of a nano-imprint mold comprising

2   the following steps:

3   (A) detecting and recording a reference capacitance of an electrostatic plate capacitor

4   embedded in the mold at a first time point before the start of an imprinting process

5   carried out with the nano-imprint mold;

6   (B) detecting a capacitance of the electrostatic plate capacitor at a second time point

7   after the imprinting process is being carried out;

8   (C) processing the capacitance detected at the second time point to obtain an amount

9   of deformation of the mold;

10   (D) feeding the amount of deformation to an external monitoring device and recording

11   the amount of the deformation;

12   (E) using the external monitoring device to display and selectively determine if the

13   amount of deformation exceeds a limit that is determined on the basis of the

14   reference capacitance; and

15   (F) if the amount of deformation exceeds the limit, then selectively issuing warning

16   and selectively stopping the imprinting process otherwise repeating steps (2)-(5).

1   12.The method as claimed in Claim 11, wherein in step (2), the capacitance of the

2   electrostatic plate capacitor is detected by a detection circuit.

1   13.The method as claimed in Claim 11, wherein in step (3), the capacitance is detected

2   by a circuit and represented as an electrical signal and wherein step (3) further

3   comprises the following sub-steps:

4   (A) modulating the signal representing the capacitance to issue a modulated signal;

5   (B) converting the modulated signal into a digital signal; and

6   (C) comparing the digital signal with the reference capacitance and calculating the

7   amount of the deformation.

1   14. The method as claimed in Claim 11, wherein in step (5), the amount of deformation

2   is directly displayed on a display device of the external monitoring device.

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